EPA Region 7 TMDL Review

TMDL ID: KS-MO-012601-11 **State:** KS
Document Name: ATCHISON COUNTY STATE FISHING LAKE

Basin(s): MISSOURI RIVER BASIN
HUC(s): 10240011
Water body(ies): ATCHISON CO. SFL/WA, ATCHISON COUNTY STATE FISHING LAKE
Tributary(ies): NONE
Pollutant(s): SEDIMENT/SILTATION, SILTATION

Submittal Date: 9/5/2007 **Approved:** Yes

Submittal Letter

State submittal letter indicates final Total Maximum Daily Load(s) (TMDL) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by EPA, date of receipt of any revisions, and the date of original approval if submittal is a phase II TMDL.

Kansas Department of Health and Environment (KDHE) formally submitted the TMDL for Atchison County State Fishing Lake in a letter format received by the United States Environmental Protection Agency (EPA) for approval on September 5, 2007.

Water Quality Standards Attainment

The water body's loading capacity (LC) for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards (WQS) [40 CFR § 130.7(c)(1)]. A statement that WQS will be attained is made.

The TMDL identifies the LC of 16.59 tons/day of sediment to achieve a reduction of 368 tons/year, or 5 tons/acre/year, the interim endpoint. This goal will reduce the sediment yield across the watershed and is the acceptable T-value for soil erosion established by the National Resources Conservation Service (NRCS) for soil in this watershed.

EPA agrees that attainment of the LCs should result in attainment of WQS.

Numeric Target(s)

Submittal describes applicable WQS, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression; site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Designated Uses:
Primary Contact Recreation (B)
Expected Aquatic Life Support
Domestic Water Supply
Food Procurement
Industrial Water Supply
Irrigation Use

Livestock Watering

Impaired Use:
Nutrients- Narrative: The introduction of plant nutrients into streams, lakes, or wetlands, from artificial sources shall be controlled to prevent the accelerated succession or replacement of aquatic biota or the productions of undesirable quantities or kinds of aquatic life. (KAR-28-16-28e (c) (2) B)).

Dissolved Oxygen: 5 mg/L (KAR 28-16-28e (c) (2) (A))

Suspended Solids- Narrative: Suspended solids added to the surface waters by artificial sources shall not interfere with the behavior, reproduction, physical habitat or other factor related to the survival and propagation of aquatic or semi-aquatic or terrestrial wildlife. (KAR 28-16-28e (c) (2) (D)).

A watershed model (AGNPS) was used to estimate loading of sediment under current land management. Results from the model indicate an annual average yield of 2, 800 tons of sediment/year.

The submittal states that all uses are impaired by siltation.

Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety (MOS) that do not exceed the LC. If submittal is a phase II TMDL there are refined relationships linking the load to WQS attainment. If there is an increase in the TMDL there is a refined relationship specified to validate the increase in TMDL (either load allocation (LA) or waste load allocation (WLA)). This section will compare and validate the change in targeted load between the versions.

The linkage for impairment to sediment is direct. The required reduction of sediment entering Atchison State Fishing Lake is 18%, or 332 tons/year. Sediment is the primary pollutant of concern of this TMDL. The proposed reduction will be allocated towards nonpoint sources, thus limiting nutrients and solids entering Atchison State Fishing Lake. Results of this reduction will allow the waterbody full support of its designated uses.

Estimations of reductions in loading to the lake were achieved with a watershed model (AGNPS). Model results indicated an annual average yield of 2,800 tons of sediment/year. These estimates corresponded to greater than 7,000 lbs/year of phosphorus and 14,000 lbs/ year of nitrogen. The results from AGNPS indicated that sediment yield ranged from 1 ton/year in the western portion of the watershed to 23 tons/acre/year in a row crop field in the southeast portion of the watershed. It is stated that not all sediment included in the yield calculation flows into Atchison State Fishing Lake.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered. If this is a phase II TMDL any new sources or removed sources will be specified and explained.

Within the watershed, land use includes row crop production, steeply sloping wooded areas and pasture. The underlying soils are predominantly highly erodable loams. Siltation is the targeted pollutant of this TMDL. Siltation occurs due to erosion, which is a displacement of solids usually by wind, water, downward slope, etc. Erosion is a highly dominant source of sediment entering Atchison State Fishing Lake from agricultural activities, thus resulting in the contribution of nutrients when soils are mobilized during runoff. A study of runoff in the Atchison State Fishing Lake watershed during 2002 was conducted by the Kansas Biological Survey (KBS) and suggested because of the lack of point sources within the watershed, the primary source of phosphorus load to the lake is sediment. Recorded high levels indicated that sedimentation is occurring during runoff events. Sediment can be transported in surface run off water and be transported in overland flow into lower land elevation, then to receiving waters.

A series of fish feeders maintained in Atchison State Fishing Lake by the Kansas Department of Wildlife & Parks annually add 6,000 lbs of fish food, analogues to an annual estimated phosphorus load of 60 lbs.

Another probable source may be leaf litter because a portion of the land in the watershed is woodland. Leaf litter may be a contributing factor to the nutrient load. The nutrient recycling, atmospheric deposition, and geological formations are considerable causes of phosphorus loads.

EPA agrees the submittal considers all significant sources.

Allocation - Loading Capacity

Submittal identifies appropriate WLA for point, and load allocations for nonpoint sources. If no point sources are present the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2 (i)]. If this is a phase II TMDL the change in LC will be documented in this section.

The LA is given as 2,199 tons/year, a 18% reduction for sediment. This calculates to an LA of 16.16 tons/day using the Technical Support Document for Water Quality Based Toxics Control (EPA/202/2-90-001) method.

WLA of zero was set for this TMDL due to lack of point sources in the watershed.

WLA Comment

Submittal lists individual WLAs for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to WQS excursions, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLAs. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a phase II TMDL any differences in phase I and phase II WLAs will be documented in this section.

Lack of point sources within the watershed resulted in a WLA of zero for this TMDL.

EPA agrees that this is an appropriate WLA.

LA Comment

Includes all nonpoint sources loads, natural background, and potential for future growth. If no nonpoint sources are identified the LA must be given as zero [40 CFR § 130.2(g)]. If this is a phase II TMDL any differences in phase I and phase II LAs will be documented in this section.

Sediment reduction of 18% entering the Atchison State Fishing Lake will result in 2,199 tons/year, or 16.16 tons/day.

EPA agrees that this is an appropriate LA.

Margin of Safety

Submittal describes explicit and/or implicit MOS for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a phase II TMDL any differences in MOS will be documented in this section.

The explicit MOS for sediment will be 243 tons/year or 1.79 tons/day. This will be a 10% reduction from the LC of 2,442 tons/year or 17.95 tons/day of sediment.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of WQS. If this is a phase II TMDL any differences in conditions will be documented in this section.

Erosion is the primary factor contributing sediment into Atchison County State Fishing Lake. Erosion is caused

by various reasons such as wind, water and ice. When it rains, water bodies erode, depositing silt and soil into the water. In conclusion, rain fall from storms are considered a critical condition of this TMDL.

Seasonal and critical conditions have been addressed in this submittal.

Public Participation

Submittal describes required public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].

Public Meetings: Since 2001, public meetings have been held to discuss TMDLs in the Missouri Basin.

To convey information to the public on the general establishment of TMDLs in the Missouri Basin and these specific TMDLs, an active internet site was established at www.kdheks.gov/tmdl/. The TMDL was available from June 2007 through August 2007.

Public Hearing: On May 20, 2007 a public hearing was held in Hiawatha in regards to the Missouri Basin TMDLs.

Basin Advisory Committee: The Missouri Advisory Basin Committee met to discuss these TMDLs on June 26,2007 and March 16, 2007 in Atchison, December 1, 2006 and January 26, 2007 in Highland, and May 14, 2007 in Hiawatha.

Comments were received from the US EPA Region 7 via emails on June 21, 2007. Necessary revisions were made and resubmitted for approval for this TMDL.

EPA agrees the TMDL received the opportunity for meaningful public input.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used) [40 CFR § 130.7].

KDHE will survey the lake twice before the midpoint of this TMDL. Further sampling will take place before 2012. Documentation of improvements in visitation and fishing, provided by Kansas Department of Wildlife and Parks, will occur once implementation is underway.

Reasonable Assurance

Reasonable assurance only applies when less stringent WLAs are assigned based on the assumption of nonpoint source reductions in the LA will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads.

Because the WLA of this TMDL was set to zero, no reasonable assurances are required. The submittal lists numerous potential state authorities to regulate point and nonpoint source pollutant within the watershed.